

NON-PUBLIC?: N

ACCESSION #: 8811180105  
LICENSEE EVENT REPORT (LER)

FACILITY NAME: Hope Creek Generating Station PAGE: 1 OF 4

DOCKET NUMBER: 05000354

TITLE: All RFPs Tripped on High Discharge Pressure Resulting In a Reactor Scram and High Pressure Coolant Injection (HPCI) Actuation - Equipment Failure  
EVENT DATE: 10/15/88 LER #: 88-027-00 REPORT DATE: 11/14/88

OPERATING MODE: POWER LEVEL:

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR SECTION 50.73(a)(2)(i)

LICENSEE CONTACT FOR THIS LER:  
NAME: Ann Merrell - Lead Engineer Technical TELEPHONE: 609 339-5239

COMPONENT FAILURE DESCRIPTION:  
CAUSE: SYSTEM: COMPONENT: MANUFACTURER:  
REPORTABLE TO NPRDS:

SUPPLEMENTAL REPORT EXPECTED: NO

ABSTRACT:

On October 15, 1988 at 1625 hours, the Plant was in OPERATIONAL CONDITION 1 (Power Operation) at 100% power generating 1085 MWe when all Reactor Feedwater Pumps (RFP) tripped on a high discharge pressure signal. The resultant loss of feedwater flow caused a scram when the reactor level reached +12.5" (level 3). Reactor water level continued to decrease to -38" (level 2) at which point High Pressure Coolant Injection (HPCI) and Reactor Core Isolation Cooling (RCIC) auto initiated and injected to the vessel. Reactor water level continued to drop to -75" inches before beginning to recover. When reactor water level reached +54" (level 8) HPCI and RCIC tripped. The "B" and "C" RFPs were reset and restored to service to control vessel inventory. An Unusual Event was declared at 1640 hours when HPCI initiated and terminated at 1643 hours when reactor water level was stabilized. The sequence of events following the RFP trips was normal and expected with the exception of the failure of the drywell equipment drain inboard isolation valve to close on isolation signal. The root cause of this occurrence was a spurious RFP high discharge pressure trip signal to all three

RFPs. Troubleshooting reduced the possible sources of the signal to a Bailey logic card which is common to all three RFP high discharge pressure trip circuits. Corrective actions include the replacement of all four of the Bailey logic cards in the feedwater system and further testing of the suspect Bailey card.

END OF ABSTRACT

TEXT PAGE 2 OF 4

#### PLANT AND SYSTEM IDENTIFICATION

General Electric - Boiling Water Reactor (BWR/4)  
Reactor Feedwater Pump (RFP) (EIIS Designator:SJ)

#### IDENTIFICATION OF OCCURRENCE

All RFPs Tripped On High Discharge Pressure Resulting In A Reactor Scram And High Pressure Coolant Injection (HPCI) Actuation - Equipment Failure

Event Date: October 15, 1988

Event Time 1625 Hours

This LER was initiated by Incident Report No. 88-150

#### CONDITIONS PRIOR TO OCCURRENCE

The Plant was in OPERATIONAL CONDITION 1 (Power Operation) at 100% power generating 1085 MWe.

#### DESCRIPTION OF OCCURRENCE

On October 15, 1988 at 1625 hours, all RFPs tripped on a high discharge pressure signal. The resultant loss of feedwater flow caused a scram when the reactor level reached +12.5" (level 3). Reactor water level continued to decrease to -38" (level 2) at which point HPCI and Reactor Core Isolation Cooling (RCIC) auto initiated and injected to the vessel. Reactor water level continued to drop to -75" inches before beginning to recover. When reactor water level reached +54" (level 8) HPCI and RCIC tripped. The "B" and "C" RFPs were reset and restored to service to control vessel inventory. An Unusual Event was declared at 1640 hours when HPCI initiated and terminated at 1643 hours when reactor water level was stabilized. The sequence of events following the RFP trips was normal and expected with the exception of the failure of the drywell equipment drain inboard isolation valve to close on isolation signal.

#### APPARENT CAUSE OF OCCURRENCE

The root cause of this occurrence was a spurious RFP high discharge pressure trip signal to all three RFPs. Troubleshooting reduced the possible sources of the signal to a Bailey logic card which is common to all three RFP high discharge pressure trip circuits.

TEXT PAGE 3 OF 4

#### ANALYSIS OF OCCURRENCE

At the time of this event the 6B Feedwater heater drain valve level transmitter was being replaced. As the technicians lifted the leads to the transmitter, they heard the RFP check valves closing. It was initially believed that the lifted lead had caused the spurious signal. Attempts to reproduce the spurious signal the leads again were unsuccessful. The possibility of an induced signal was researched using the design drawings and by a field walkdown of the cables to determine if there was interaction due to common power supplies or circuits as well as possible electro-magnetic interference noise due to cable routing. No condition was found which could support the induced signal hypothesis. Additionally, the loop under test is 24 VDC whereas the buffered inputs to the RFP discharge pressure transmitter are 125 VDC, making an induced signal highly unlikely. The suspect Bailey card has an induced voltage filter which would normally eliminate spurious signals. The possibility that the high pressure signal had not been spurious was also investigated by reviewing the GETARS points for the RFP turbine. No increase in discharge pressure or pump speed had occurred. Actual GETARS pressures were well below the trip setpoints. The calibration of the RFP discharge pressure transmitter was also verified to be correct. Additionally, attempts to reproduce the signal by rapping on the instrument tubing were unsuccessful. Based on the results of these investigations, it was concluded that the high pressure signal was spurious and was not caused by the leads being lifted. A further review of the RFP logic drawings indicated that the only common device to the three pressure transmitters is the Bailey card.

Testing of the suspect Bailey card did not find it to be faulty. Further testing of the card using a different test device is planned.

All of the anticipated isolations occurred with the exception of the drywell equipment drain inboard isolation valve which showed dual indication and did not appear to close fully on isolation signal. The valve was successfully closed after the equipment drain sump pump was run to flush the line and then the valve was stroked four times to further verify operability.

TEXT PAGE 4 OF 4

#### PREVIOUS OCCURRENCES

There have been no other coincident RFP trips which were the initiating event for a reactor scram.

## SAFETY ASSESSMENT

All safety systems functioned as designed and would have limited any radioactive releases. For this reason, the health and safety of the public were not compromised by this event.

## REPORTABILITY

This report is being submitted pursuant to the requirements of 10CFR50 .73 (a) (2) (iv).

## CORRECTIVE ACTIONS

1. All four of the Bailey logic cards for the feedwater system were replaced although only one was considered to be the probable origin of the spurious signal. As previously indicated, further testing of suspect Bailey card is planned.
2. As previously described, the drywell equipment drain inboard isolation valve line was flushed to restore the valve operability. At a subsequent outage, drywell entry was made and the valve open indication limit switch was adjusted, the valve was stroked and correct valve position indication was verified.

Sincerely,

J. J. Hagan  
General Manager  
Hope Creek Operations

AM:

SORC Mtg. 88-154

ATTACHMENT #1 TO #8811180105 PAGE 1 OF 1

PSE&G  
Public Service Electric and Gas Company P.O. Box 236 Hancocks Bridge,  
New Jersey 08038

Nuclear Department

November 14, 1988

U. S. Nuclear Regulatory Commission  
Document Control Desk  
Washington, DC 20555

Dear Sir:

HOPE CREEK GENERATING STATION  
DOCKET NO. 50-354  
UNIT NO. 1  
LICENSEE EVENT REPORT 88-027-00

This Licensee Event Report is being submitted pursuant to the requirements of 10CFR50.73 (a) (2) (iv).

Sincerely,

J. J. Hagan  
General Manager  
Hope Creek Operations

AM:

Attachment  
SORC Mtg. 88-154

\*\*\*END OF DOCUMENT\*\*\*

ACCESSION #: 8811180111

---